

REMARKS

Claims 1-43 are pending. By this amendment, claim 1 is amended to clarify the recited subject matter, and claims 44-48 are added. Neither the claim amendments nor the additional claims add new matter. Reconsideration in view of the above amendments and following remarks is respectfully requested.

Claim Rejections - 35 U.S.C. §102

Claims 1, 3, 5, 7, 8, 10, 11, 13, 14, 16-18, 25, 28 and 30 are rejected under 35 U.S.C. §102(b) over WO-97/27370 (WO '370). The rejection is respectfully traversed because WO '370 fails to teach or suggest each and every element of the rejected claims.

For example, with regard to claim 1 and the claims dependent therefrom, WO '370 fails to teach or suggest a sound absorbing structure comprising at least one porous member including a plurality of holes, wherein said holes are at least one kind of through holes, that penetrate through the porous member, and/or non-through holes, that extend into but do not penetrate through the porous member as recited in claim 1.

The WO '370 reference merely discloses a sound-absorbing element including a sheet of material with holes in it, in which the material sheet is self-supporting and the holes are microslits (Page 5, lines 20-25). Also, the sheets of WO '370 are made of plastics or metals (Page 7, lines 23-26). In contrast, the present invention proposes a porous foam member with a specific cell structure to obtain a satisfactory sound absorbing effect in a wide frequency range. (Page 5, lines 1-10)

The sound absorbing device in WO '370 has its own natural frequency defined by a hole and an atmospheric layer behind the hole. When the frequency of the noise, which is incident on the hole, corresponds to the natural frequency, resonance occurs. (FIG. 4) Then the energy of the noise is changed into thermal energy and the noise is extinguished because the friction between the atmosphere and the side of the hole. That is, the vibration of the atmosphere around the hole absorbs the noise. Conversely, in the present invention, the

vibration of the inner walls of cells in a porous or foam member absorbs the noise (Page 36, lines 1-9).

In addition, the WO '370 reference does not teach or suggest the use of non-through holes that extend into but do not penetrate through a porous member. The use of non-through holes formed on a porous member having a closed-cell structure (as recited in claim 2) improves the sound absorbing effect (Specification page 14, lines 2-10). Moreover, the absorbing characteristic in a desired frequency range can be improved by using a plurality of through holes and non-through holes and/or by adjusting the size of the through holes and non-through holes (Specification page 14, lines 17 and page 20, lines 6-26).

WO '370 fails to disclose the use of non-through holes in a porous member as recited in claim 1 and discussed above. Thus independent claim 1 is patentable over the teachings of WO '370 and is, therefore, allowable. Moreover, dependent claims 3, 5, 7, 8, 10, 11, 13, 14, 16-18, 25, 28, 30 are allowable at least for the reasons discussed above with respect to claim 1 and for the additional features recited therein.

Thus, reconsideration and withdrawal of the rejection of claims 1, 3, 5, 7, 8, 10, 11, 13, 14, 16-18, 25, 28, 30 under 35 U.S.C. §102(b) over WO '370 is respectfully requested.

Claims 1-3, 5-11, 14, 16, 17, 19, 22-25, 28-30 are rejected under 35 U.S.C. 102(b) over WO96/28297. The rejection is respectfully traversed because WO96/28297 does not teach each and every element recited in the rejected claims.

For example as discussed above WO96/28297, like WO '370, fails to teach or suggest a sound absorbing structure comprising at least one porous member including a plurality of holes, wherein said holes are at least one kind of through holes, that penetrate through the porous member, and/or non-through holes, that extend into but do not penetrate through the porous member as recited in claim 1.

WO96/28297 merely discloses a sound absorbing component including an expanded body of a fiber-reinforced thermoplastic resin having a voidity of at least 50 vol. % and a

resin molded body (Abstract). This material is too hard to obtain the noise absorption features of the present invention. The material made of fiber reinforced thermoplastic resin includes open cells. Consequently it contains many complicated continual spaces and cells between fibers. When the noise is incident upon the spaces and cells, the atmosphere therein repeats the expansion and compression corresponding to the frequency of the noise. This repetition causes the temperature of the atmosphere to change. Then, a transition of the heat between the atmosphere and the fibers occurs. Therefore, the noise is absorbed because of thermal conduction. Including through holes with a porous member made of fiber reinforced thermoplastic resin, which contains open cells, does not cause the sound absorbing characteristics to drastically change (See Specification, page 27 line 18- page 28 line 11, and page 31, comparative examples 4 and 6).

Consequently, WO96/28297 does not teach or suggest the use of through holes and/or non-through holes, as recited in claim 1 of the current invention, to improve the sound absorbing effect or the absorbing characteristic in a desired frequency range as described in the current invention (Specification page 14, lines 2-10 and 17 and page 20, lines 6-26) and discussed above.

Claims 2-3, 5-11, 14, 16, 17, 19, 22-25 and 28-30 depend from claim 1 and are therefore allowable at least for the reasons discussed above with respect to claim 1 and for the additional features recited therein.

Thus, withdrawal of the rejection of claims 1-3, 5-11, 14, 16, 17, 19, 22-25 and 28-30 over WO96/28297 is respectfully requested.

Claim Rejections - 35 U.S.C. § 103

Claims 4, 15, 26, and 27 are rejected under 35 U.S.C. §103(a) over WO'370. The rejection is respectfully traversed because the WO'370 does not teach or suggest all the features of the rejected claims.

As explained above with respect to the §102 rejection, WO'370 does not teach or suggest a sound absorbing structure comprising at least one porous member including a plurality of holes, wherein said holes are at least one kind of through holes, that penetrate through the porous member, and/or non-through holes, that extend into but do not penetrate through the porous member as recited in claim 1.

Claims 4, 15, 26, and 27 depend directly or indirectly from claim 1 and are, therefore patentable at least for the reasons stated above with respect to claim 1 and for the additional features recited therein.

Therefore, reconsideration and withdrawal of the rejection of claims 4, 15, 26, and 27 under 35 U.S.C. §103(a) over WO'370 is respectfully requested.

Claims 4, 12, 15, 20, 21, 26 and 27 are rejected under 35 U.S.C. §103(a) over WO'370. The rejection is respectfully traversed. Again, WO'370 does not teach or suggest the features of claim 1 as explained above with respect to the §102 rejection. Claims 4, 12, 15, 20, 21, 26 and 27 depend directly or indirectly from claim 1 and are, therefore, patentable at least for the reasons stated above with respect to claim 1 and for the additional features recited therein.

Therefore, reconsideration and withdrawal of the rejection of claims 4, 12, 15, 20, 21, 26 and 27 under 35 U.S.C. §103(a) over WO'370 is respectfully requested.

Claims 31-43 are rejected under 35 U.S.C. §103(a) over WO'370 in view of Sensenig (U.S. Patent No. 5,888,626). Again, WO'370 does not teach or suggest the features of claim 1 as explained above with respect to the §102 rejection.

Sensenig fails to remedy these deficiencies. Sensenig merely discloses a plain, fine textured product consisting of a wood or mineral fiber substrate and surfacing without holes or perforations. Thus, the combined teachings of WO'370 and Sensenig fail to provide all the features recited in claim 1 and, consequently claims 31-43 dependent therefrom.

Therefore, reconsideration and withdrawal of the rejection of claims 31-43 under 35 U.S.C. §103(a) over WO'370 in view of Sensenig is respectfully requested.

In view of the foregoing, the claims are in form for allowance, and such action is hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, he is kindly requested to contact the undersigned at the telephone number listed below.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached Appendix is captioned **"Version with markings to show changes made"**.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,

Pillsbury Winthrop LLP

By: 

Glenn J. Perry

Reg. No.: 28458

Tel. No.: (703) 905-2161

Fax No.: (703) 905-2500

GJP\CDB  
1600 Tysons Boulevard  
McLean, VA 22102  
(703) 905-2000  
Enclosure: Appendix

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

1. (Amended) A sound absorbing structure comprising at least one porous member including a plurality of holes, wherein said holes are at least one kind of through holes, that penetrate through the porous member, and/or non-through holes, that extend into but do not penetrate through the porous member.